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Reith

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(54) **SPRAY GUN EXTENSION ADAPTER**

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B05B 15/06 (2006.01)

(52) **U.S. Cl.**
CPC ***B05B 15/061*** (2013.01)

(58) **Field of Classification Search**
CPC B25G 1/04; B65D 83/201; B65D 83/202; B65D 83/203; B05B 11/3056; B05B 11/3057; B05B 15/061; B05B 3/087; B05B 7/0081; B05B 7/129; B05B 7/2478; B05B 9/0426; B05B 9/0894; B05B 12/008; B05B 12/1409; B05B 5/025–5/06; B05B 15/06
USPC 239/153
See application file for complete search history.

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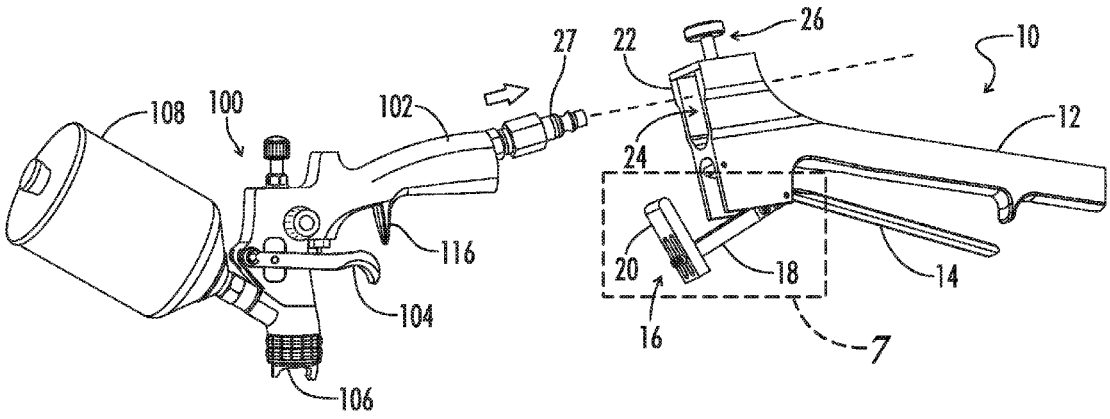
(57) **ABSTRACT**

A spray gun extension adapter allows a user to extend the reach of a spray gun. The adapter includes a mount shaped for receiving the spray gun. The adapter includes an adapter handle shaped to be gripped by a user. An adapter trigger is linked to an adapter actuator that operates the spray gun when the adapter trigger is engaged. The adapter actuator is positioned on the adapter to engage the spray gun trigger in some embodiments.

18 Claims, 5 Drawing Sheets



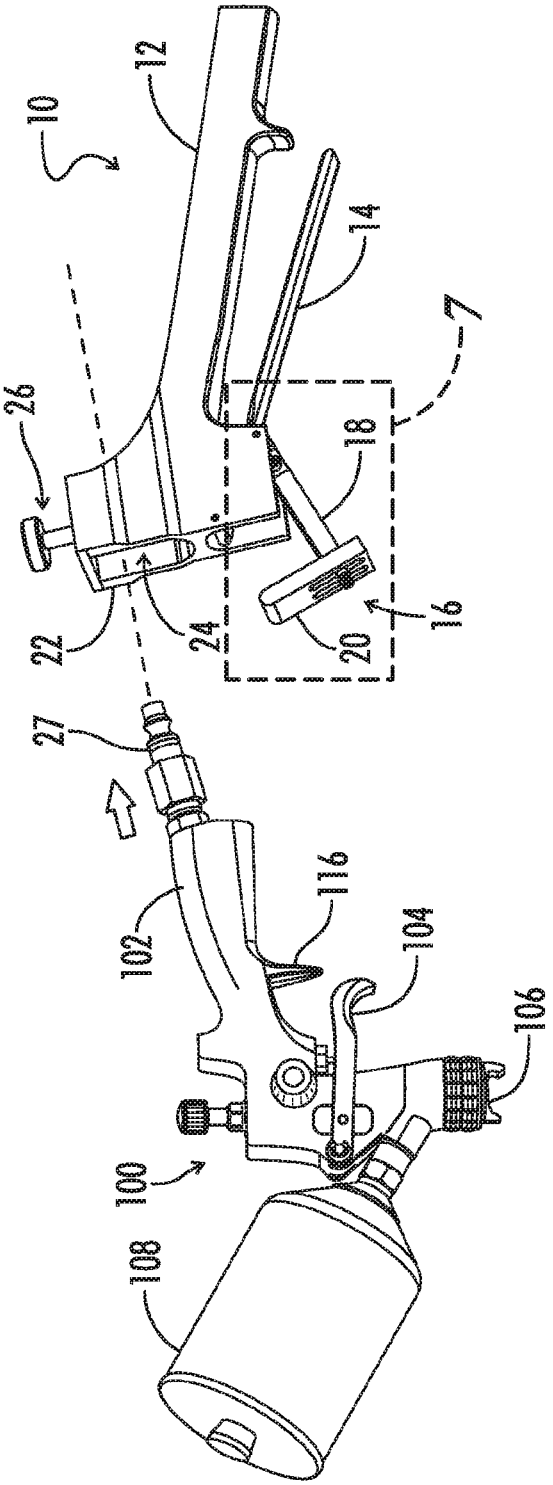


FIG. 1

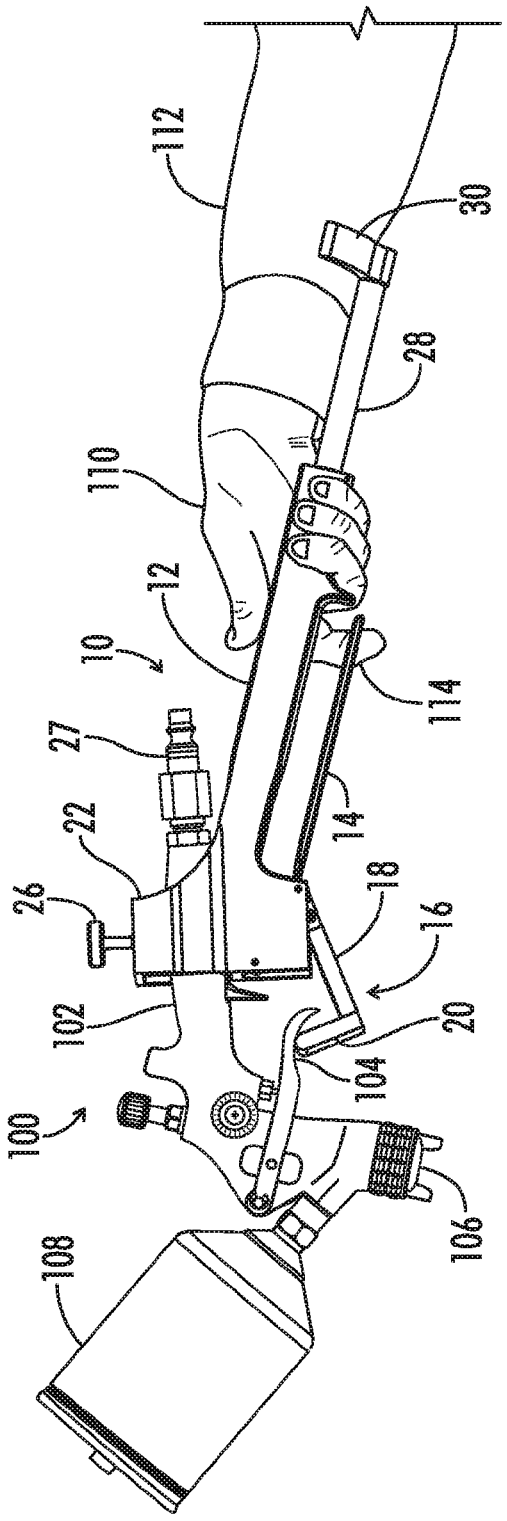


FIG. 2

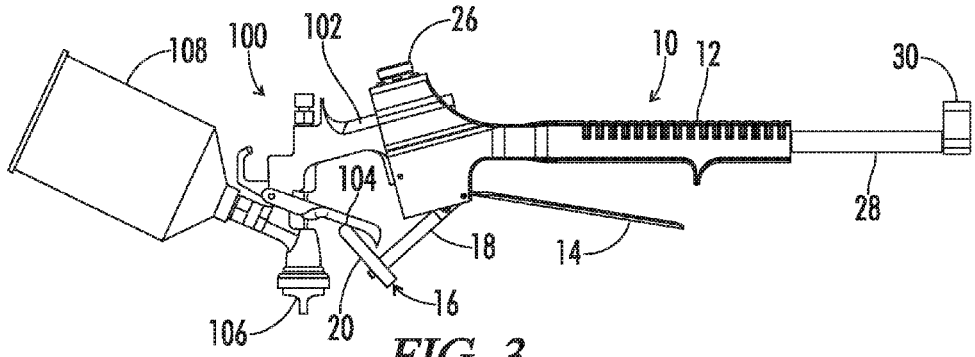
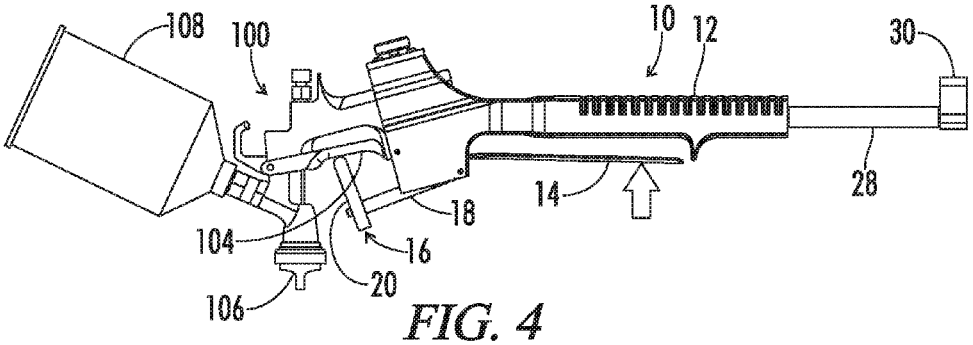

108
100
102
26
10
12
30
104
28
18
14
16
106
20

FIG. 3


108
100
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18
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16
20
106

FIG. 4

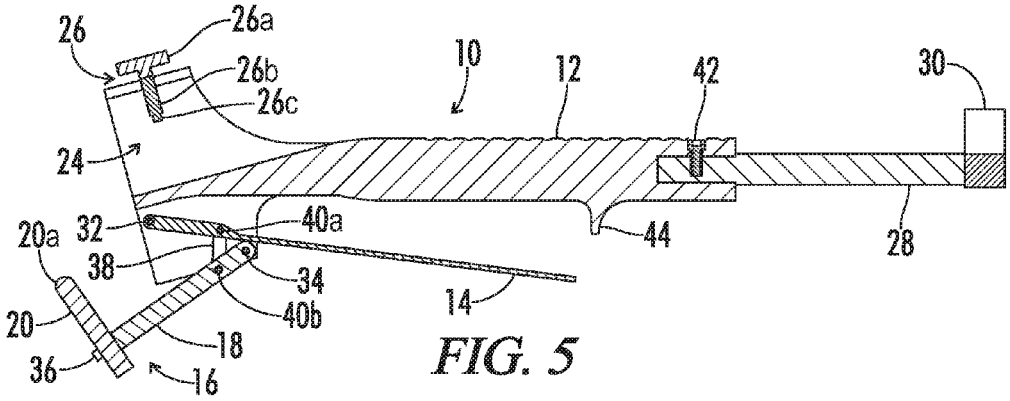
26
26a
26b
26c
10
12
42
30
24
20a
32
40a
44
28
38
34
40b
14
20
18
36
16

FIG. 5

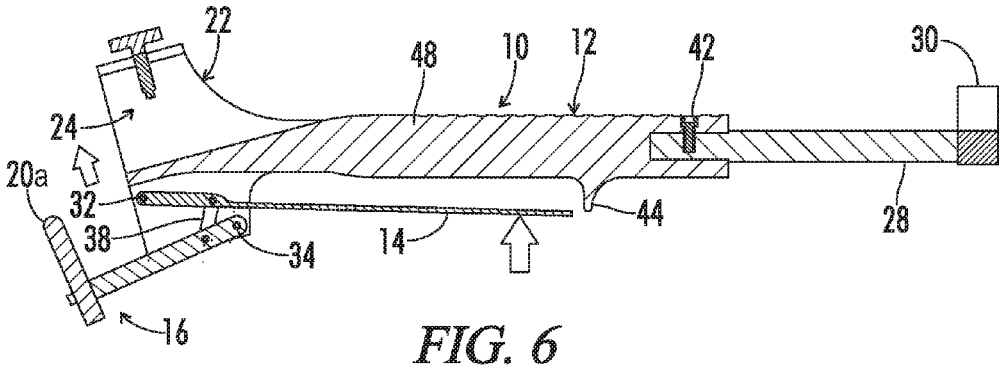
22
48
10
12
42
30
24
20a
32
44
28
38
34
14
16

FIG. 6

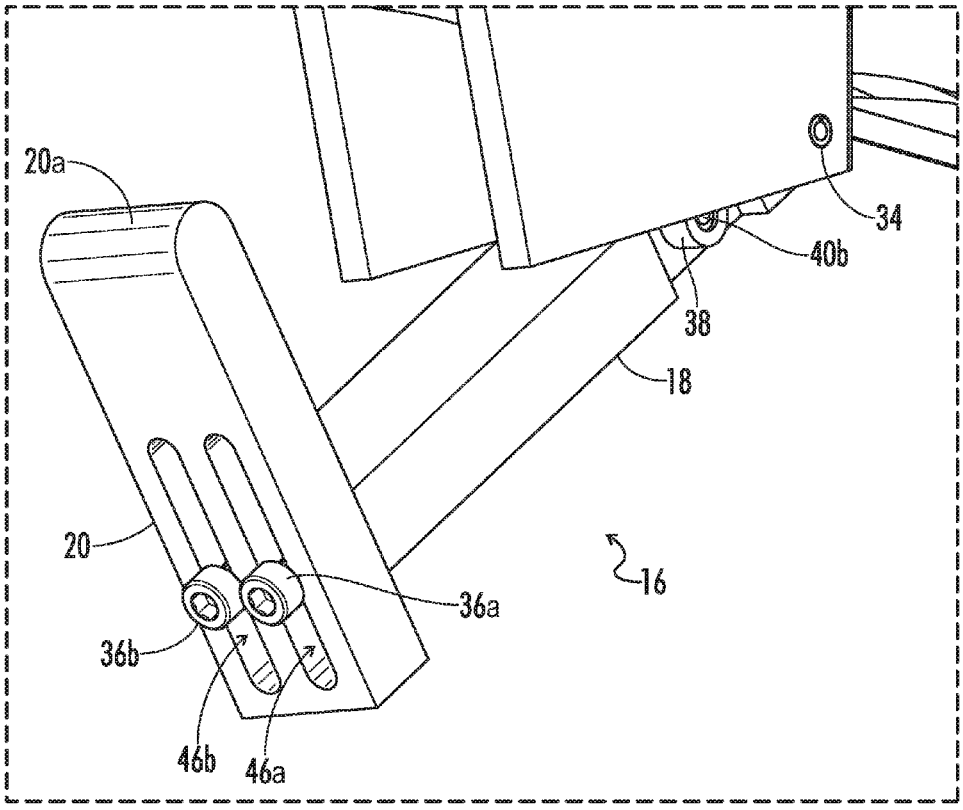

FIG. 7

SPRAY GUN EXTENSION ADAPTER

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims benefit of the following patent application which is hereby incorporated by reference: None.

BACKGROUND OF THE INVENTION

The present invention relates generally to devices for spraying materials and more particularly to adapters for handheld paint spray guns used, for example, to apply paint to motor vehicles.

Spray gun devices are generally known in the art for applying materials to surfaces. Spray guns typically include a nozzle or orifice from which a liquid, gas, or powdered material is ejected toward a substrate to be coated. Common applications of spray gun devices include spray guns for applying paint, varnish, sealant, lacquer, pigment, cleaners, abrasives, etc. Spray guns are used in a variety of industries, including in the automotive industry for painting vehicle components and in other industrial and agricultural applications.

Spray guns typically include one or more handles configured to be grasped by a user. The handle or handles are typically attached to a frame or body. A nozzle or orifice may also be attached to the frame or body of the spray gun. Spray guns typically also include an actuation mechanism such as a trigger or button for selectively releasing the material to be sprayed. Additionally, spray guns may include a container for storing the material to be sprayed. During use, a user will grasp the handle and engage the actuation mechanism to control the flow of spray material.

One problem associated with the use of spray guns is the limited reach of the spray gun device. Spray guns are usually dimensioned such that a user can lift and manipulate the gun. To achieve this goal, spray guns are usually of a size that can be easily handled by a user. When a user extends his or her arm while holding the spray gun, the range of spray coverage is generally limited by the distance the user can extend the arm. When the spray gun is extended to the user's maximum reach, the user must either move to a new position or move the substrate to further extend coverage with the spray gun.

Another problem associated with conventional spray guns is that they may be heavy. As a user holds a spray gun and extends the spray gun away from the user's body, a mechanical moment is created acting downwardly against the spray gun. This may cause the spray gun to inadvertently rotate in the user's hand. One example of the aforementioned problems is seen in the application of automobile paint spraying. When a user is painting an automobile or similar object using a handheld spray gun, such as an HVLP spray gun, the user must extend the user's arm to reach areas such as the center of a hood or top of the automobile. The area a user can spray may be limited by the user's reach. As such, users of handheld spray guns often struggle to extend the reach to cover large areas. This can cause the spray gun to tilt or rotate to a position that does not emit the sprayed material in a direction normal to the substrate surface. This is generally undesirable.

What is needed, then, are improvements in the devices and methods for extending the reach of a spray gun.

BRIEF SUMMARY OF THE INVENTION

The present invention provides a spray gun extension adapter. The adapter allows a user to extend the reach of a spray gun.

An object of the present invention is to provide a spray gun extension adapter having a mount shaped to receive a spray gun. The adapter also includes a handle spaced from the mount. An adapter trigger is positioned near the adapter handle. When a user engages the adapter trigger, an actuator on the adapter operates the spray gun to emit a spray of material. When a user releases the adapter trigger, the spray is terminated from the spray gun.

A further object of the present invention is to provide a spray gun extension adapter having a frame with a mount and an adapter handle. An adapter trigger is also disposed on the frame. The adapter trigger is linked to an adapter actuator. When the adapter trigger is engaged, the adapter actuator moves and operates the spray gun.

A further object of the present invention is to provide a method of extending the reach of a spray gun. The method includes the steps of providing an extension adapter having an adapter handle, an adapter trigger and an actuator; and mounting the spray gun on the adapter.

Yet another object of the present invention is to provide a spray gun extension adapter that is compatible with high velocity, low pressure (HVLP) spray guns.

Another object of the present invention is to provide a spray gun extension adapter with a mount that does not interfere with a hose fitting installed on the spray gun handle.

Numerous other objects, advantages and features of the present invention will be readily apparent to those of skill in the art upon a review of the following drawings and description of a preferred embodiment.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. **1** illustrates a partially exploded perspective view of an embodiment of a spray gun and an adapter apparatus in accordance with the present invention.

FIG. **2** illustrates a perspective view of an embodiment of a spray gun adapter and spray gun held in a user's hand.

FIG. **3** illustrates a side elevation view of an embodiment of a spray gun adapter and spray gun.

FIG. **4** illustrates a side elevation view of the embodiment of a spray gun adapter and spray gun of FIG. **3** with the adapter trigger in an engaged position.

FIG. **5** illustrates a partial cross-sectional view of an embodiment of a spray gun adapter.

FIG. **6** illustrates a partial cross-sectional view of an embodiment of a spray gun adapter.

FIG. **7** illustrates a detail perspective view of an embodiment of an actuator on a spray gun adapter.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, various embodiments of the invention are illustrated. An embodiment of a spray gun adapter **10** positioned to receive a spray gun **100** is shown in FIG. **1**. Spray gun **100** generally includes a spray gun handle **102** and a spray gun trigger **104**. During use, a user or operator typically grasps the spray gun handle **102** and engages the spray gun trigger **104** to cause material to be sprayed from

nozzle **106**. Additionally, in some embodiments, spray gun **100** may include a tank **108** for storing the material to be sprayed. A finger guard, or spray gun trigger guard **116**, may also be positioned on the spray gun **100** to prevent a user's finger from being pinched by spray gun trigger **104**.

Spray gun adapter **10** includes an adapter handle **12** and a mount **22** in some embodiments. Spray gun **100** is generally attached to the spray gun adapter **10** at mount **22**. Mount **22** can include any suitable structure or location on adapter **10** for attaching the spray gun **100** to adapter **10**. As seen in one exemplary embodiment in FIG. **1**, mount **22** includes a mount recess **24** having a recess geometry configured or adapted by shape, size and/or depth for receiving spray gun handle **102**. Spray gun handle **102** slides into mount recess **24**, and a clamp **26** on adapter **10** may be used to secure the spray gun handle **102** in the mount recess **24**. In some embodiments, clamp **26** includes a threaded post that may be tightened against the spray gun **100** to secure the spray gun **100** to the adapter **10**. Clamp **26** can include other suitable clamping structures in various other embodiments.

Mount recess **24** includes front and rear openings to allow passage of a pressurized gas line to be coupled to the handle on spray gun **100**. For example, as seen in FIG. **2**, in some embodiments, when spray gun handle **102** is installed in mount recess **24** on adapter **10**, a gas fitting on spray gun handle **102** may extend from mount **22** allowing ease of attachment or disconnection with a pressurized gas line from a compressor. Embodiments may include a supply line **27** (which may be at least one of the gas fitting and the pressurized gas line described above) extending away from the adapter handle **12** when the spray gun handle **102** is installed in the mount recess **24** on the adapter **10**.

Also seen in FIG. **1**, adapter **10** includes an adapter trigger **14**. Adapter trigger **14** is linked either directly or indirectly to an adapter actuator **16** on adapter **10**. Adapter actuator **16** is positioned to engage spray gun trigger **104** when spray gun **100** is installed on adapter **10**, as seen in FIG. **2**. When a user engages adapter trigger **14**, adapter actuator **16** is configured to operate spray gun **100** by engaging spray gun trigger **104**. Thus, a user may operate spray gun **100** without directly engaging the spray gun trigger **104**. For example, as seen in FIG. **2**, a user may grip adapter **10** at the adapter handle **12**. Adapter trigger **14** may be engaged by one or more user fingers **114**. When the adapter trigger **14** is engaged, a mechanical linkage causes movement of adapter actuator **16**, thereby operating the spray gun **100**. By selectively engaging and releasing the adapter trigger **14**, a user may control the spray emitted from the spray nozzle **106** on spray gun **100**. Spray gun trigger **104** is thus selectively engageable, as a user may engage the adapter trigger **14** to spray material and then release the adapter trigger **14** to stop spraying material.

Referring to FIG. **3** and FIG. **4**, an embodiment of a spray gun adapter **10** with a spray gun **100** mounted thereto is shown. Adapter **10** in FIG. **3** is shown with adapter trigger **14** in an unengaged position. In this position, adapter actuator **16** is not depressing spray gun trigger **104** enough to cause material to be emitted from nozzle **106**. In FIG. **4**, adapter trigger **14** is shown in an engaged position. In this position, spray gun trigger **104** is pushed toward spray gun handle **102** by actuator **16**. This causes material to be sprayed from nozzle **106**. In some applications, the amount of material emitted from nozzle **106** may be controlled by the displacement of adapter trigger **14**. When adapter trigger **14** is only slightly depressed or engaged, a small amount of material may be sprayed from nozzle **106**. However, as adapter trigger **14** becomes more fully engaged, or depressed toward adapter handle **12**, a greater volume of material may be sprayed from nozzle **106**.

Referring further to FIGS. **1-6**, in some embodiments, adapter actuator **16** includes an actuator arm **18** and an actuator head **20**. Actuator head **20** includes a distal head end **20***a*, seen in FIG. **5** and FIG. **6**. Distal head end **20***a* on actuator head **20** forms the portion of adapter actuator **16** that is operable to engage spray gun trigger **104** in some embodiments. Adapter actuator **16** is linked to adapter trigger **14** in a mechanical linkage. Forced movement of adapter trigger **14** generally causes a corresponding movement in adapter actuator **16**. As seen in FIG. **5** and FIG. **6**, in some embodiments, adapter trigger **14** is coupled to actuator **16** using a linkage member **38**. Thus, as seen in FIG. **6**, when adapter trigger **14** is engaged, or pressed toward adapter handle **12**, linkage member **38** pulls upwardly on actuator arm **18** and causes actuator head **20** to move upwardly generally toward the spray gun trigger **104**. As such, adapter trigger **14**, linkage member **38**, and actuator **16** form a four-bar linkage, or four-bar mechanism. In some alternative embodiments, actuator **16** is integrally formed as part of adapter trigger **14** in a unitary construction. As such, forced movement of adapter trigger **14** causes a corresponding movement of adapter actuator **16** for operating the spray gun.

Adapter **10** includes a frame **48** in some applications. Frame **48** includes a handle **12** and a mount **22** disposed on the frame. Frame **48** provides a longitudinal extension for extending the reach of a spray gun when the spray gun is installed on the mount **22**. A user may grasp handle **12**, as seen in FIG. **2**. Adapter trigger **14** is pivotally attached to frame **48** at a trigger pivot **32**. Additionally, adapter actuator **16** may be pivotally attached to frame **48** at an actuator pivot **34** in some embodiments. Linkage member **38** is also pivotally attached to adapter trigger **14** at a first linkage pivot **40***a*, and linkage member **38** is also pivotally attached to adapter actuator **16** at a second linkage pivot **40***b* in some embodiments.

Referring further to FIG. **1** and FIG. **7**, in some embodiments, adapter actuator **16** includes an actuator arm **18** and an actuator head **20**. Actuator arm **18** is pivotally attached to frame **48** at actuator pivot **34**. Actuator head **20** may be adjustable to accommodate different spray guns. Adjustability of actuator head relative to actuator arm allows adapter **10** to be used interchangeably with different spray guns that may have different spray gun trigger geometries. For example, as seen in FIG. **7**, actuator head **20** is moveable relative to actuator arm **18**. In some embodiments, actuator head **20** includes one or more travel slots such as first and second travel slots **46***a*, **46***b*. Actuator head **20** may be attached to actuator arm **18** via a plurality of head fasteners **36**. A first head fastener **36***a* is disposed in first travel slot, and a second head fastener **36***b* is disposed in second travel slot. Each head fastener secures actuator head **20** to actuator arm **18**. Actuator head **20** may be moved longitudinally relative to actuator arm **18**, and then first and second head fasteners **36***a*, **36***b* may be tightened against actuator head **20** to fix actuator head in place relative to actuator arm **18**. Although adapter actuator **16** is shown in FIG. **7** with travel slots and fasteners, various other suitable mechanical configurations for providing adjustability to actuator head may be utilized.

As seen in FIG. **5** and FIG. **6**, in some embodiments, adapter **10** includes an adapter trigger guard **44** protruding downwardly from adapter handle **12**. Adapter trigger guard **44** provides a longitudinal reference point for a user to grasp adapter handle **12**, as seen in FIG. **2**. A user may grasp adapter handle **12** adjacent trigger guard **44** such that none of the

user's fingers become trapped or pinched between the underside of adapter trigger **14** and adapter handle **12**.

Referring further to FIG. **5**, in some embodiments, clamp **26** includes a clamp knob **26***a* attached to a threaded clamp post **26***b*. A user may manually turn clamp knob **26***a* to tighten clamp distal end **26***c* against spray gun **100**. Additionally, in some embodiments, mount **22** is shaped to receive the handle of spray gun **22** such that the spray gun trigger guard **116** provides a longitudinal stop when spray gun handle **102** is inserted into mount recess **24**, as seen in FIG. **1** and FIG. **2**.

Referring again to FIG. **2**, in some embodiments, adapter **10** includes an arm support **28** protruding from adapter handle **12** on adapter **10**. Arm support **28** includes a longitudinal extension protruding toward a user's forearm **112** when the user is grasping adapter handle **12**. Arm support **28** may include a longitudinal rod attached to adapter handle **12** on adapter **10**. In some embodiments, arm support **28** is removable, or detachable, from adapter **10** via one or more arm support fasteners **42**, seen in FIG. **5**. For example, a user may choose to operate adapter **10** without arm support **28**. Additionally, a detachable arm support **28** allows adapter **10** to attain a lower profile for storage, use, or shipment. Also seen in FIG. **2**, in some embodiments, an arm brace **30** is disposed on the arm support **28**. Arm brace **30** may have a curved profile to correspond to a user's forearm **112** in some embodiments. In some embodiments, arm brace **28** is telescoping and may be longitudinally adjustable to fit different users.

As seen in FIG. **2**, attachment of spray gun **100** to mount **22** on adapter **10** extends the reach of the spray gun nozzle **106** away from the user's hand **110**. This allows a user to cover more area with spray gun **100**. Additionally, the user's hand **110** may serve as fulcrum between adapter handle **12** and arm support **28**. As such, the weight of spray gun **100** is counterbalanced by the engagement of arm support **28** and arm brace **30** with the user's forearm **112**. This makes it easier for a user to operate spray gun **100** and reduces user fatigue in some applications.

Adapter **10** may be constructed of any suitable material, such as polymers, plastics, metals, composites, etc. In some embodiments, adapter **10** is made of machined metal such as aluminum for reduced weight.

In further embodiments, the present invention provides a method of extending the reach of a spray gun. The method includes the steps of: (a) providing a spray gun extension adapter having a handle, an adapter trigger and an adapter actuator; and (b) mounting the spray gun on the adapter.

Thus, although there have been described particular embodiments of the present invention of a new and useful Spray Gun Extension Adapter apparatus, it is not intended that such references be construed as limitations upon the scope of this invention except as set forth in the following claims.

What is claimed is:

1. An extension adapter apparatus for use with a spray gun, comprising:
- an adapter handle;
- a mount configured to receive the spray gun;
- a selectively engageable adapter trigger; and
- an adapter actuator linked to the adapter trigger, the adapter actuator including an actuator arm and an actuator head,
- wherein the actuator head is slidably adjustable relative to the actuator arm, and
- wherein the adapter actuator is positioned to operate the spray gun when the adapter trigger is engaged.

2. The apparatus of claim **1**, further comprising a linkage connecting the adapter trigger to the adapter actuator.

3. The apparatus of claim **1**, further comprising a clamp disposed on the mount.

4. The apparatus of claim **1**, further comprising an arm support extending from the adapter handle.

5. The apparatus of claim **4**, further comprising an arm brace disposed on the arm support.

6. The apparatus of claim **1**, further comprising a mounting recess defined on the mount.

7. An adapter apparatus for extending the reach of a spray gun, comprising:
- a frame including a handle end and a mount end, the handle end opposite the mount end;
- an adapter handle disposed nearer the handle end than the mount end of the frame;
- a mount disposed nearer the mount end than the handle end of the frame, the mount having a geometry configured to receive the spray gun;
- a selectively engageable adapter trigger pivotally attached to the frame nearer the mount end than the handle end;
- an adapter actuator disposed nearer the mount end than the handle end of the frame; and
- wherein the adapter actuator is configured to operate a spray gun trigger when the adapter trigger is engaged.

8. The apparatus of claim **7**, wherein the adapter actuator is pivotally attached to the frame at an actuator pivot.

9. The apparatus of claim **8**, further comprising a linkage member connecting the adapter trigger to the adapter actuator.

10. The apparatus of claim **9**, wherein the frame, adapter actuator, adapter trigger, and linkage member form a four-bar linkage.

11. The apparatus of claim **7**, further comprising a clamp disposed on the frame.

12. The apparatus of claim **7**, further comprising an arm support extending from the frame.

13. The apparatus of claim **12**, wherein the arm support is detachable.

14. The apparatus of claim **7**, further comprising an adapter trigger guard protruding from the adapter handle.

15. The apparatus of claim **7**, wherein the adapter actuator comprises an actuator arm and an actuator head.

16. The apparatus of claim **15**, wherein the actuator head is adjustable relative to the actuator arm.

17. The apparatus of claim **16**, wherein the actuator arm is pivotally attached to the frame.

18. An adapter apparatus for extending the reach of a pneumatic spray gun including a pneumatic spray gun handle and a supply line, comprising:
- a frame;
- an adapter handle disposed on the frame;
- an adapter trigger disposed on the frame;
- an adapter actuator disposed on the frame, the adapter actuator actuated when the adapter trigger is engaged;
- a mount disposed on the frame, the mount defining a hole configured to receive the pneumatic spray gun handle;
- wherein an axis of the hole is angled relative to the adapter handle to direct the supply line away from the adapter handle; and
- wherein the mount is configured to nonadiustably maintain the axis of the hole at only a single fixed angle relative to the adapter handle.

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